Best Practices in Integration of Procurement and Financial Management Data

Prepared by the NECCC
Financial/Procurement Data Integration Work Group

NATIONAL ELECTRONIC COMMERCE COORDINATING COUNCIL

NECCC is a consortium of national organizations and public and private sector leaders identifying best practices for strategic change within government.

Alliance partners are:

National Association of State Auditors, Comptrollers and Treasurers
National Association of Secretaries of State
National Institute of Governmental Purchasing

NECCC also works in partnership with these affiliate organizations:

Association of Government Accountants
Information Technology Association of America
National Automated Clearing House Association
National Association of Government Archives and Records Administrators
National Association of State Treasurers

Table of Contents

Introduction

This work group paper is intended to inform finance, procurement, and information technology professionals about how to more effectively integrate financial and procurement systems. The scope of the project grew from a narrower focus on just data integration to a broader objective of identifying best practices designed to promote successful integration of financial and procurement data.

The central thesis of this paper is that procurement and financial data should be given equal attention. Unfortunately, when enterprise information systems are deployed, procurement functionality tends to be an afterthought. Organizations that fail to look more broadly at opportunities to integrate financial and procurement data lose the ability to create efficiencies that can be achieved by entering data once and reusing it in transactions. More importantly, they lose the ability to leverage the integrated information to better see spending trends, identify strategic opportunities to aggregate requirements, and then realize savings in the future. If planning is not done collaboratively upfront, there will be adverse affects on the implementation in terms of schedule or cost. Failure to engage stakeholders early on and use the best practices identified in this paper may put the integration vision at risk entirely.

This work group paper looks at best practices in integration efforts that meet the needs of all internal customers. The paper is agnostic to vendors and products and is based on the recent experiences of public entities in migrating to new systems or integrating separate ones. The best practices identified here are based on research, the collective experiences of members of the work group, and interviews of persons having recent experience.

While this paper is organized in planning, procurement, and contract administration sections, it all serves as a roadmap for planning. The work group thought that providing advice on practical issues arising during the life cycle of an integration project was the best way to organize the presentation. This paper begins with strategic questions. It is important to build a common understanding of terms, beginning with the role of information and data, and how the data supports the primary business objectives of organizations in terms of finance and procurement. The paper introduces a fundamental distinction between migration of data to new or upgraded systems – the legacy system problem – and the integration of data between coexisting systems. There are problems unique to each.

Another theme of this paper is the need for early establishment of a cross-functional planning and governance structure that includes senior leadership as well as functional experts in the use of information and data.

From a planning perspective, the paper will describe common data elements needed in financial and procurement systems, and cover in some detail special problems with data integration inherent in the objectives of reporting and analysis, on one hand, and workflow or production efficiencies on the other.

Next, the paper will turn to considerations that arise relative to procurement strategies. Included in this section is advice on market research, what to include in solicitations, and phasing. Achieving a common understanding between the government and vendor of the expectations, costs (including government resources) and schedule associated with the project is a key issue raised by those interviewed by the work group.

Then the paper will cover some issues from the perspective of implementation. The preparation of a data conversion plan is an early part of the post-award phase. And while the prospects of a project being on-budget and on-time are better when the best practices outlined in this paper are followed, these implementations are complex – one can expect changes to be needed. Consequently, a change control system must be developed that balances costs against functionality. During contract performance, as change proposals are evaluated, the data integration/migration choices will have impacts on cost, schedule, and functionality, as well as resource requirements for the government entity supporting the project. The implementation stage is when the realism of government agency resource estimates is generally called into question. This paper advocates for the establishment of cost contingencies in these projects.

The appendix to this paper includes a checklist of topics and issues, arranged to coincide with the procurement phases. The paper identifies resources found valuable by the work group, including previous NECCC work group papers that offer insight into the issues.

As a side note, the lessons and best practices set forth in this paper are also relevant to other integration projects, for example budgeting and human resources system integrations. For the sake of brevity, though, the scope of the paper has been limited to the issues involved in financial system and procurement system integration.

The Strategic Questions: Understanding the Benefits and Costs of Information and Data

Data, Information, and Strategy

Data Versus Information. A critical first step is achieving an organizational understanding of the use of the data, its value as "information," its relevance to insight and strategy, and its importance in performance improvement through action.[1] Data can be defined as "items representing facts, text, graphics, bit-mapped images, sound, analog or digital live-video segments, the raw material of a system supplied by data producers and used by information consumers to create information."[2] Data typically is considered the lowest order of objective measurement. When some context and organization is added to make the data relevant to organizational decision-making, then it becomes "information."[3]

Strategy and Action. Information only has relevance if it contributes to activity consistent with the organization's overall strategy. The promise of integrated financial and procurement systems is that the extensive information enables governments to manage finances, comply with financial reporting requirements, exercise appropriate controls, manage suppliers, secure better pricing, handle audits and planning, anticipate availability problems, and improve the overall financial and purchasing processes.

True integration means data is reused: entered only once and centrally maintained. This permits multiple access to and use of information for various purposes without having to reenter information in disparate systems. An example that illustrates the point is an integrated system that permits entry of supplier information for accounts payable and use of the information for purchase order issuance, electronic submission of invoices, and electronic receiving reports.

Organizations need to have early discussions about what objectives are being satisfied by data integration strategies in any information system deployment. The charts of accounts and commodity code structure are examples. Both sets of data have implications in terms of cross mapping and the resources necessary to either migrate to a new system or integrate between coexisting systems. Charts of accounts facilitate financial reporting on the one hand, and ideally permit allocation of purchase order payments during the PO execution and payment process. Commodity codes can be used in a workflow engine for routing requisitions for approval and sourcing, and at the same time are key to inventory systems and for doing forecasting. However an organization spending money on its commodity code structure (for license fees, implementation and maintenance costs) is not cost effective unless the organization adapts procurement strategies that use the information.

Dimensions of Interoperability: Data Migration, Integration, Interfaces, and ETL

Interoperability is defined as effectively linking two or more systems (functionalities) or organizations in a partial or fully transparent manner for users. The work group found the data issues different depending on the nature of the information system deployment.

This paper uses the term "migration" to refer to the movement of data from one system to another. This might be from a legacy (or old) system to a more modern enterprise-wide system, or from one system to an upgraded version of the same system. System implementation requires decisions about which of the old data to import into the new system.

In the context of financial/procurement integration, "systems integration" commonly means optimizing electronic purchasing systems to work well with the electronic bidding, inventory, finance and other software the enterprise may have. While enterprise resource planning systems are designed for integration between modules, integration of "stand alone" systems requires "links" between legacy systems and the electronic procurement system. Integration of separate systems involves decisions such as to whether to use "batch" versus "real time" connectivity between them. The term "interface" refers to the transfer of data elements between the disparate systems that are being integrated.[4]

Common to data migration or development of interfaces that integrate systems is ETL, or "extraction, transformation, and loading." ETL means that data needs to be accessed and extracted, loaded, validated, cleaned, standardized, transformed, and then loaded. ETL activities are involved in all types of implementations: migrating from old to newer systems or developing interfaces between existing systems. The work involved with ETL accounts for a good share of the agency's resource requirements in supporting system implementations. This ETL concept is typically referred to in the context of loading a data warehouse.

Understanding these distinctions is important when discussing implementation and procurement strategies. The issues and questions that need to be asked are different when talking about migration, integration, interfaces, and ETL.

Two Other Dimensions: Reporting Versus Production

When making choices about data migration and integration, understanding the distinction between reporting and production is useful. From the reporting perspective, data is useful as information to report a snapshot in time view of quantifiable facts. The balance sheet, income statement, accounts payable in purchasing, vendor expenditure history, and the like provide quantifiable information. Regarding reporting, one decision to be made is whether to retain historical information in the older system and then use that

system to provide analysis relevant to that period of time when the older system was the system of record.

On the other hand, some information is directly related to current operations and production. For example, vendor files are accessed throughout the transaction history from issuance of the purchase order through invoicing and payment. This is commonly referred to as the transaction or production side of the system; it directly implicates efficiencies in transaction processing. So while reporting-related data (i.e., object code history on expenditures) might be retained in the old system, there may be no need to import that history to the new system. However, production data like the vendor information must come over somehow in order to support the transaction processing. Similarly, inventory systems must plan for the migration of data schema over to the new system to support existing material management operations.

The planning phase of data integration and migration implementations must account for the different ways that the information will be used.

Quality of Data

One recurring theme the work group heard was, "we chose not to import the old data because we had no confidence in its accuracy." Whether a financial, procurement, human resources, or other systems implementation, a candid look at the quality of the data in the feeder system should be considered. In fact, some information technology failures have been attributed to the failure to "cleanse" or delete data prior to conversion, complicating the automated conversion and post implementation clean-up process.[5]

If data has not been actively used for analysis and transactions – the case with some commodity code structures not supporting an active inventory operation – there may be little confidence in the accuracy of the data. Vendor files and tables, in particular, may not be susceptible to as much automated migration as originally expected without significant amounts of pre-migration cleansing.

Supplier Integration and Content Management

As governments extend their boundaries outward to their supplier community, there are additional issues and considerations. Enabling the appropriate degree of application interoperability and data exchange between the government procurement/financial system (or systems) and the supplier ordering/financial systems is a difficult part of supply chain optimization. However, it is also an area where tremendous value can be obtained.

From the supplier perspective, there are numerous pieces of data that are important to the supplier to be presented and represented accurately in the government system. This includes data elements such as

contact information, selected areas of interest or competency, product/item descriptions, product/item prices, and contract terms and conditions. The conventional wisdom is that the burden of providing accurate, complete, and up-to-date data should fall to the supplier, since they are the party that initiates the data and they a vested interest in it.

To accomplish this, governments allow suppliers a form of supplier integration and content management by creating electronic interfaces between the supplier systems and the government's system. Usually a pre-defined list and format of data elements is specified, and vendors can automatically upload their data to the government's system. The government applies edits to assure validity of data formats, and to the extent possible, the accuracy of data values. The alternative to this approach is for the supplier to furnish the data in a non-electronic medium, usually paper. The government then assumes the task of data entry into its system. The benefits of the supplier integration (or interface) approach are considered to be reduced data errors and improved cycle time.

In addition to the exchange of data elements is the ability to execute transactions in both the supplier and government's systems. This is considered a higher form of supplier integration that can also create significantly greater value. An example is a Web-based catalogue where government users can navigate from their system into the supplier system, execute a transaction for which they are authorized (for example a purchase from a catalogue), and then return to the government's system. Another example is electronic inventory, where suppliers can navigate from their system into the government's system, examine inventory levels, execute a transaction for which they are authorized (for example making and shipping an order for inventory replacement), and then return to the supplier system. These "higher" forms of supplier integration and content management have increased challenges but also increased benefits. There are several business issues that must be addressed, for example liability for a failed transaction. Also there are several technical issues, for example the numbering/identifying convention for individual product items. While these challenges are not trivial, the benefits are seen as compelling. The most effective examples of supplier integration and content management enable collaboration, with significant increases to efficiency, reduction of errors, elimination of redundant workflows, and real-time insight into the business needs of the business partners.

However, increased supplier integration and content management from the buyer perspective does not equate to a total delegation of responsibility. The government must maintain a degree of control and responsibility. Statutory and policy requirements relating to safeguarding public assets usually means the government will dictate what is allowable in terms of application interoperability and data exchange. For example, the government will want to have proper control over the vendor contract information to assure an effective audit trail for year-end tax reporting. As another example, the government will want to guarantee that product/item prices are in conformity to the legal contract. In the traditional – usually paper -- environment the government accomplished its requirements by controlling the data entry. As

governments move to electronic approaches for supplier integration and content management, the requirements need to be satisfied in different ways. One common approach is the elimination of a relatively large number of low-level data entry clerks, with a shifting of work and responsibility to a comparatively fewer number of higher-level staff reviewing and approving supplier-furnished information, for example electronic catalogues. The higher-level staff usually works in the business unit, i.e., the purchasing organization.

The key point is that increased levels of supplier integration and content management still require a degree of government resources, albeit different and possibly less expensive than the traditional world, in order to be successful.

Multi-Jurisdiction Integration

There are examples of states developing Web-based procurement systems to provide a single Internet portal through which the state and political subdivisions can buy and sell goods and services. These systems provide aggregated procurement data for analysis, beyond just state government usage. With multi-jurisdiction integrations across governmental boundaries, there are greater coordination challenges. They also require development of an interface methodology that accommodates multiple ERP systems. In these projects, it is more difficult to set standards for data such as vendor identifiers, ordering data elements, and agency information. For example, while tax identification numbers may be adequate to identify vendors, other approaches to identifiers may have to be coordinated for various vendor locations and agency shipping and billing addresses/locations across the state. To address these issues, suppliers are critical team members when trying to meld together government procurement objectives with the realities suppliers face in managing their supply and service chains.

Planning

Planning consists of forecasting what will happen during the vendor selection and implementation phases of the project. While we will discuss procurement strategy and contract administration considerations later in the paper, they also must be considered during planning. We focus here on financial/procurement data integration issues that should be considered during the planning phase.

Importance of Cross-Functional Teams in Data Migration/Integration Planning

A recurring theme has been the necessity of getting cross-functional teams involved early in the planning stage. Constructive engagement of leaders is essential to project success. They can help by encouraging involvement by stakeholders who sometimes resist project implementation. Especially as integration

projects reach into other programs – e.g. grant programs using self-developed subsystems – getting those program representatives to the table can be challenging.

While senior steering committees are important in the project to manage change, demonstrate executive buy-in, and generally improve the odds of success, implementations will fail if governance does not also adequately involve personnel who work in the business processes and know what data is needed and how it is used. A balance in team makeup between senior steering committees and functional experts is essential.

Early discussions about what the organization is hoping to achieve with data is important. Many higher-level executives may not know the effect of decisions that are being made. For example, if an enterprise chooses to only implement system modules that support financial reporting and budget control, then more discrete procurement data is not required, but the agency will forfeit strategic opportunities related to procurement. If an enterprise needs visibility into expenditure patterns and transaction volume to perform more strategic sourcing, then more discrete procurement data is needed. If the enterprise is seeking to optimize its internal processes and create transaction-processing efficiencies, then workflow is essential.

The point is that early discussion by teams, both at the steering committee and work group levels, is required. The best models appear to be those in which the senior steering committee includes representatives from major functional areas (like finance and procurement) so they see that appropriate functional expertise is committed to the project. Work groups are organized around functional areas (such as inventory, purchasing, reports and analysis, accounting) comprised of persons experienced in the business processes and who know the information and data needs of the organization, how information is used, and how transactions are processed.

Common Planning Issues and Approaches

Financial Data

It is not unusual in a joint procurement-financial project to have some disagreement between the respective business units about what constitutes "mandatory" versus "discretionary" data. In fact, just within the financial community, there is not a single standard. Given this situation, the work group suggests the following approach to define mandatory versus discretionary financial data.

One criterion to consider is the requirement to produce audited financial statements in conformity to generally accepted accounting principles. To accomplish this requirement the preparer of the financial statements must be able to take information at whatever level of detail it is recorded and accounted for in the system of record and formulate that data into several different financial statements. The auditor of the statements must be able to trace individual transactions from the source system up through the financial statements. This means the financial people need to capture information in certain buckets, referred to as

accounts in the chart of accounts. Typically the required (or mandatory) accounts and data include revenue or expenditure account, fund, payee, organization and other data elements summarized in Appendix A. To the extent any transaction, including purchasing transactions, involves one of those attributes, the data would be considered mandatory.

A second criterion is satisfaction of other reporting requirements, often based in statute or regulation. This is not financial statement reporting per se; rather it is required reporting that is financial in nature. A good example is the requirement to report payments to payees at year-end, often referred to as the W-2 or 1099 process. Other examples include a variety of reports that might be required by state or federal law, such as revenues and expenditures by individual programs of federal financial assistance, revenues and expenditures related to individual bond authorizations, revenues and expenditures by certain expendable trusts, and revenues and expenditures by various attributes compared to budgets. Typically the accounts and data to satisfy special and required reporting supplements the previous list and also includes other elements like sub funds (sometimes called reporting category) and projects (sometimes called grant or program).

A third criterion that helps define mandatory versus discretionary financial data relates to internal controls. The assignment of roles and responsibility for initiating, reviewing, and approving certain transactions is typically correlated to the workflow (either manual or automated) of transactions. In order to demonstrate compliance to internal controls, certain data elements are usually required. Again the list of data overlaps with the prior lists, with additional elements such as names/identification numbers and dates or other unique identifiers for transactions.

Taken as a whole, these three criteria provide guidance to the determination of mandatory data. Therefore, from the perspective of the financial community, all other data elements would be considered "discretionary." In the typical government chart of accounts and procurement-financial system there are many additional data attributes that pertain to the purchasing function. While these data elements are discretionary from the financial point of view, they could be critical, indeed mandatory, from the procurement point of view.

Basic Procurement Data for Purchasing Transactions

The data typically captured for purchasing transactions exceeds that required for financial purposes. For example, there are performance period/delivery date requirements, transportation terms, multiple shipment locations in some cases, commodity code or line item (e.g., SKU) information, and other transaction-related data. The vendor tables typically are much more complex and include more sophisticated payment and credit terms, allowance terms for delivery and payments, discount terms, and quantity tolerances. The transactions commonly permit partial receipts, credits, and separate itemization

for taxes and freight/transportation charges. Appendix A has a list of common data elements used in purchasing systems.

To appropriately plan your data migration and integration strategy, it is essential to get financial and purchasing personnel to make a joint assessment and decision about what data elements are required.

Historical Data

One of the key questions to be answered is the extent to which historical data will be moved into the new system. Generally, with new systems, organizations appear to be migrating balances and summary information necessary to operate under the new system. But there is a recurring need to have access to historical information. There are various approaches to the problem.

One approach is to retain the data in some accessible format for a period of time. This is to support historical analysis and audits. Record retention requirements vary among the states, but seven years is a common retention requirement. Some projects address this requirement by archiving data (onto tapes or some other electronic format) that can be retrieved upon request. Others do it by migrating historical data into a database for reporting (i.e., a data warehouse).

A mechanism must be found whereby consistency of historical analysis can be accomplished when the analysis calls for data from the old system as well as the new. For example, if the chart of accounts is changed, some type of mapping or crosswalk table is needed in order to correlate, in a multi-year analysis, information collected the old way versus the new way. As another example, if data is captured in the old system but labeled a certain way and equivalent data is captured in the new system but labeled a different way, again some type of crosswalk mechanism is needed. If data exists in one system but not the other, obviously there is no basis for historical comparisons. To the extent data exists in both, and is defined the same way, the need for a crosswalk mechanism is eliminated.

Deciding what historical information to migrate involves a cost-benefit analysis. This requires an assessment of the frequency of historical data analysis, the number of people who will be conducting it, other value that might come from migrating the data, and the relative costs of the different approaches to retaining and making historical information available. Bringing historical information over requires the development of a data map between the two systems. Examples of information that is essential to both the old and new systems but often is added to the new system on a "going forward" basis are project identifiers and commodity codes.

Where data needs to be migrated for only a few records, it is often preferable to manually reenter the data rather than design and build computerized scripts/modules to automatically migrate the data.

A data conversion plan is a critical part of the project and serves to specify the sources of data, what needs to be converted, the method (manual, automated, or mixed) and who is responsible. When conducting a solicitation, a description of the vendor's approach to this topic is useful and would demonstrate the vendor's understanding of the requirements, experience in this kind of work, and the soundness of the vendor's approach to data migration and integration. The Implementation and Change Control section of this paper (page 21) has a more complete explanation of the elements of a data conversion plan.

Data Warehouses

An emerging practice is the use of data warehouses, not only to record historical information from old systems, but also for reporting and analysis in new systems. They have three major benefits. Data warehouses provide a user interface for analysis that can be learned by a broad range of users that may only occasionally use the production applications. Second, data warehouses provide a platform for integrating relevant data from across various applications that may not be fully integrated. And thirdly, data warehouses move the analytical functions away from the production environment and avoid the system performance degradation that may occur when analysts are constantly accessing the production system.[6]

Data warehouses are typically a third party application, independent of the production application. They require detailed planning for ETL. Data warehouses may be a strategic adjunct to a project because they solve the historical information retrieval issue and in many cases are thought to be the better solution for most users needing reporting capabilities.

In some systems, a data warehouse already may have been developed to provide better access to the information for users who were not active users of the system. For the same reasons, even new system implementations use data warehousing. Users often have a need to access information in these systems, but they do not use them often enough to be able to build the queries in the systems necessary to extract the information. In this instance, there will be a mini-integration project even with migration to a new enterprise system as the agency plans for integrating the system into the data warehouse.

Batch Versus Real Time Interface

There are two basic approaches that are used to integrate data between systems. In batch integration, a download or extract of data is performed at a scheduled time, usually at a time where there is less production use of the system. Often this is done at night. Then there is an upload of the data into the other system. The advantages of this type of interface include ease and lower costs of development and use of fewer system resources to perform the interface. This is the type of interface used in data warehouses.

The other kind of integration – "real time" – means that the moment that the entry is made in a system, it opens the companion system, often does a query into the other system for "edit checking," and records the data or retrieves related data. This kind of integration has the advantage of keeping the records in-sync immediately. Disadvantages include the expense in developing the interface and the system resource drain. Every time this kind of real time "handshake" occurs between two systems, there is a cost in terms of system resources. Decreased system response time is sometimes the result.

The term "middleware" is commonly used to refer to software that is designed to permit different applications to communicate with each other even though they are running on different platforms.[7] "Messaging" (sometimes referred to as a message "broker") is one means of accomplishing these types of integrations. Messaging means various things in different applications in terms of the actual connectivity, how the communication between the applications occurs, and what that means in terms of performance and time. Messaging in statewide implementations that include political subdivisions has lessened dependency on specific vendor solutions and permits changes to the integrated systems without adversely affecting interoperability.

It is important to reach a clear understanding of just what any particular integration approach means in terms of transaction time and system resources. In an integration of an e-procurement system and financial system, for example, any delay at the order initiation stage to permit integration with the financial system might detract from the desired efficiency improvements of the system.

Where some level of real time integration is not necessary, "batch" is used. So long as daily updates provide adequate accuracy for the intended use – common in reporting applications and data warehousing – there is no need to ensure perfect synchronization.

However there are other situations where real time integration is needed.

Encumbrances are used as a form of budget control to ensure that funds are available before a commitment is entered with a vendor. Where used, they should be edited in real time. Some but not all states use pre-encumbrances. If pre-encumbrances are used, they should also be edited in real time. When pre-encumbrances are used, batch editing of the later encumbrance is usually acceptable. However, if pre-encumbrances are not used, encumbrances should be processed in real time. Otherwise one loses the budget control that real-time interfaces provide.

The extent and nature of batch versus real time integration should consider the encumbrance method used in the financial system, the relative functionality and ease of use of each system, the technical and resource capability of the entity to maintain the interface, the nature of existing workflows in the system, the complexity and cost to achieve the integration, and any sacrifice in efficiency from the kind of integration being considered.

Commodity Codes

The work group confirmed the findings of a 2001 NECCC work group paper that analyzed the various commodity codes and their strengths and weaknesses.[8] Recent experience with commodity codes appears to validate many of the conclusions in that whitepaper. Namely,

- Public procurement agencies appear to be gravitating toward the National Institute of Governmental Purchasing (NIGP) commodity code, because its structure is more "friendly" to public procurement categories than the commercial codes such as the United Nations Standard Products and Services Code (UNSPSC®).

- NIGP provides better granularity for inventory operations.

- Commodity codes, even where the system implementations accommodate them, have not been fully utilized for achieving leveraged purchasing.

- Commodity codes are finding use in workflow as they control how requisitions can be routed and approvals obtained based on commodity codes that distinguish between various goods and services. For example, different buyers may be assigned to – and approvals required for – technology purchases and, within them, between computer and communications supplies and services.

- Commodity code purchasing history is not migrated automatically during new system implementations. In some cases this is because there is little confidence that the commodity code information was accurate.

The choice of commodity codes depends on the systems currently in place, and the purchasing system and functionalities desired. When implementing a purchasing system, an entity may choose certain functionalities such as solicitation distribution and electronic receipt of vendor's catalogs through a third-party supplier network. Commodity codes often are used for organizing catalogues and determining which solicitations are distributed to suppliers based on the categories they select.

E-procurement vendors usually rely on suppliers to maintain their catalogues. This can create complexity if agencies use NIGP commodity codes in their ERP systems, and vendors maintain their catalogues using UNSPSC commodity codes. Because of the expense involved, vendors may be reluctant to maintain duplicate catalogues, one coded for public entities and another with UNSPSC codes for private entities. Some projects that allow agencies to order directly from a vendor's catalog have found it necessary to create and maintain a two-way crosswalk in order to accommodate dual commodity code systems. The crosswalk is especially difficult to create because it is dependent often on a single state's

interpretation, and use of commodity codes which may be different among agencies even in the same state.

Development of a two-way cross walk has a tendency to reduce the granularity provided by the NIGP code structure. But if solicitation distribution systems, inventories, and integrated catalogue ordering will coexist in the system, an approach to this issue must be developed.

Inventory

Inventories are still used in government operations such as human services, corrections, and other programs with large facilities and operations. The functions in inventory management systems can be divided into three primary categories: warehouse management, financial management, and reporting. An inventory management system must allow warehouse staff to efficiently issue and receive items to/from the warehouse while tracking the financial data. An integrated system allows an entity to increase the overall efficiency with which assets are tracked and accounted for, and accurately create accounting transactions to expense items to programs and accounts as items are issued.

The system should track sales, allow for part information lookups, link the billing type (i.e. indirect/direct) with each part number so that no institutional knowledge is required to properly determine costing, and force valid data entry of part numbers, vendor numbers, program codes, and employee numbers. The system should provide the ability to adjust on-hand levels based on physical counts, facilitate physical counts, and add items to inventory that have been purchased through the standard purchasing methods and alternate methods (i.e., procurement cards). Data collected through the inventory management system typically supports a large number of reporting options. Of particular importance are the decisions made when populating new data fields. The length of available character fields, for example, is a significant consideration when establishing conventions for entries such as the vendor "short name."

The work group did not find any evidence of migration of large amounts of data with inventory system migration. We suspect that the new system SKUs or inventory codes – that are usually a more complete use of the NIGP commodity code at the 9-digit level – are populated manually without an automated solution. To the extent that this phase of the implementation could be aligned with annual inventory counts, that would be helpful.

Without automated conversion, considerable resources will be required to move from an old to a new system. Having a person on the planning team who has managed an inventory under the old system is critical. It is likely they will be experienced in the use of the purchasing modules as well.

Procurement Card Data

Procurement or purchase cards (p-cards) generally streamline the purchasing and payment process by allowing employees to purchase items directly from suppliers without having to process separate invoices and payment transactions. The procurement card issuer periodically sends transaction summary files to the governmental entity, permitting consolidated payments to the issuing bank.

Systems that allow transaction data to be uploaded from the bank's p-card system into the agency's financial system reduce the work involved in recording the small purchase data into the financial system. These procurement card reconciliation systems often also include workflow to permit internal approval of individual transactions during the reconciliation process.

Procurement card transaction files typically can be imported from the card issuer directly into the payables module. Many credit card systems have Web-based self-service applications that permit transaction verification and manual override of default accounting distributions set up by the user. This functionality requires that the new system have an interface with or the ability to import from the procurement card issuer. In order to capture sufficient object code information for the accounting system, software solutions often are used to map the bank's transaction file to specific object codes for the accounting system. For any migration to a new system, or integration to existing financial and procurement systems, the integration of procurement card transaction data must be considered.

Level III data from the procurement card system promises someday to provide purchasing detail concerning commodity categories, but currently there are fewer than 20% of vendors who are capable of providing Level III data. Even where Level III data is available, the commodity coding structure used by the card systems is different from NIGP and the UNSPSC commodity code structure used by many agencies and vendors having online catalogue systems.

When evaluating purchasing systems, public entities should consider current and future security standards. For example, purchasing systems should have a field designated to accept a Purchase Card Identification Number (CID). A CID number is an additional number located above the card number (or on the back of the card) and is an industry standard security feature. Some vendors contractually choose to collect both the CID number and the card number from their customers and use it as additional verification with the purchase card company. Unless the purchasing system captures this information, the purchase card transaction may be declined.

Workflow

The newer systems are moving beyond simple approvals to workflow. While legacy systems typically had distributed approval capability, with various officials having the authority to record approvals on purchase orders and payment vouchers, the newer systems are adding workflow.

Workflow engines can intelligently categorize a purchase – often based on purchase price and commodity code – and route a requisition for approval to a specific office. For example, requisitions for commodities with information technology commodity codes might be routed to the IT department, and requisitions can go to specific buyers in the agency's purchasing office.

These systems are new enough that there is not much experience migrating workflow from old to newer systems. Nor did the work group find workflow integration issues involving separate, standalone systems. But there is considerable data collection and loading effort involved in setting up these workflow systems that must be accounted for in the planning phase. Efforts include:

- Collecting, loading, and managing contact information such as names, addresses, telephone numbers, and e-mails.

- Developing specific rules (often Boolean-based) that establish various routing outcomes for combinations of variables such as amounts, commodity codes, and prior office approvals.

- Establishing and managing delegation permissions for these workflow activities.

Other Possible Integration Issues

There are other sub-systems that will have to be considered during migration to new systems or integration between disparate systems. Entities having these systems need to involve the system "owners" early in the planning process. When system owners are late additions to the planning process, the implementation efforts are impeded. These are some of the most well known:

- Enterprise-wide financial systems have modules for payroll. More robust payroll and human resources systems add functionality that manages employee deductions and tax withholding elections. Human resources systems also add personnel position control, employee benefits management, and workflow and transaction processing.

- Programs funded with federal funds typically have subsystems that allocate costs consistent with federal cost standards, e.g., labor and other project costs. Departments of transportation have systems that enable their reporting and receipt of federal funds on highway programs. Departments of labor/employment and human services departments typically are heavily funded by federal funds. Institutions of higher education also have cost allocation subsystems supporting their grant programs.

- Institutions of higher education have student information systems and sophisticated accounts receivable payable systems, often operated by the bursar's offices.

- Contract management systems permit management of contracts throughout their life cycle, facilitating monitoring of delivery dates, triggering procurement actions related to options and reprocurement, and helping manage contract closeout. Most agencies have developed some means of tracking contracts, and these may present additional opportunities for integration.

- Activity-based costing systems are fairly new to public entities and are "cousins" to cost allocation models and subsystems commonly used for federal and other grant program administration. Activity-based costing, or ABC, systems permit tracking costs against defined activities and permit more discrete analysis of activity costs than exist with traditional methods of allocating indirect costs to broad cost allocation drivers like labor costs. These systems where implemented may be additional candidates for integration.

Procurement Strategies

One key to achieving a successful migration or integration is reaching clarity at the award phase about the respective expectations. From product functionality, to definitions of "customization," through government resources required during implementation, the changes that are driven after contract execution often are a result of inadequate planning and the parties' failing to achieve a common understanding of expectations up-front. This section of the paper will highlight procurement strategies that promote success.

Utility of Market Research

Market research is essential for learning issues of importance to the vendors. Market research is valuable in order to find out as much as possible about functionality, resource requirements for the agency, schedule realism, magnitude of integration costs, etc., so a better solicitation can be developed.

Use market research to highlight the procurement requirements and get a preliminary assessment of what information should be disclosed as part of the solicitation. Market research discussions can also illuminate key questions that should be asked during the solicitation phase to get contractually binding representations from vendors as part of proposals.

In the work group's experience, vendors are less likely to be forthcoming with ideas in a public conference. One-on-one vendor meetings are more likely to promote open discussions. Of course, public entities must avoid conducting market research in a way that steers requirements towards a particular vendor's solution. More traditional market research tools – e.g., requests for information (RFIs) and pre-RFP vendor conferences – can be a helpful adjunct to one-on-one market research.

Solicitation Development

Importance of the Solicitation

The fact that performance, cost, or schedule expectations sometimes are not met reinforces the importance of planning and the solicitation phase of the procurement. The solicitation is key to achieving as much clarity as possible about expectations concerning functionality, cost, and schedule.

Solicitation Information

The more information the agency makes available to vendors, the better their ability to forecast project requirements and propose sound solutions. Appendix A lists information found to be of interest to vendors, including:

- Basic description of software applications in use and their versions, along with a description of significant modifications and customizations.

- Charts of accounts and a description of the financial controls/encumbrance requirements.

- Commodity code structure.

- Types of data warehousing tools, if any.

- Standard software reporting tools.

- Available staff and other resources that can be committed to assist in the implementation, including some idea of the knowledge, skills, and aptitudes (or "skill sets") of government personnel that will be supporting the implementation.

- Whether independent verification and validation (IV&V) contractors will be used on the project, and the nature of any other third party contractor involvement.

- Data migration and conversion standards.

- A clear description of the data schema that will be subject to conversion, and any specific data conversion requirements. Known limitations are also useful. For example, some systems retain all data in ALL CAPS formats, while other systems have case-sensitive data fields, an inconsistency that can cause difficulties with integration.

Solicitation Strategies

One of the recurring issues identified by the work group was an absence of a clear understanding at the time of award about what functionality exists in the current product, what functionality requires

customization, and what functionality is awaiting a future release. Appendix A lists topics that are recommended for inclusion in solicitations so vendors can provide the best information in their responses. A few of those points are summarized below.

- *Vendor Experience.* There was general agreement by the work group that a key to success is using vendors who have completed an integration or migration/upgrade project of similar scope and with the same software applications. Ask for references and check them. Ask for recent, representative copies of software conversion plans.

- *Technical Approach.* The cross functional planning team will identify significant risks related to data integration and migration that could be evaluated and a subject of discussion with vendors. Encumbrances and commodity codes implicate key transaction processing aspects of these systems and would be good topics to ask vendors about, so they could demonstrate their understanding of the requirements and the soundness of their technical approach in light of the overall business objectives of the government. Evaluation plans typically include these topics as evaluation considerations, along with the apparent risk from ambiguous technical approaches and limited understanding of the government's requirements.

- *Data Conversion.* With respect to all functions, but in particular data conversion tools, is the product user-friendly? Ideally, include a brief demonstration about key functions, such as assisted data conversion tools. Robust systems should contain desktop supported tools, such as Microsoft Excel, to facilitate data conversion tasks like upload, cleansing, and use of ASCII interfaces to facilitate conversion. The data conversion aspects of the integration project are estimated to take up to 50% of the project team's time, so user-friendliness in these functions is important.

- *Reporting and Workflow.* Ask for a description of reporting and development/maintenance of workflow business rules. Evaluate the capabilities and friendliness of the user interface and workflows, difficulty of configuration and customization, complexity of importing and exporting data, and requirements for system maintenance and operation from the perspective of the information technology office.

- *Customization and Releases.* The procurement should be fashioned so features are clearly understood in terms of what is available in the product now, what is anticipated in future releases, what functions have to be "customized," who performs the customization, and the costs associated with all of these issues. Define those terms in the solicitation and fashion responses around a common definition. For example, a requirements table could require use of "B" as base/core functionality, meaning no modifications or customization is required. "C" could mean that the system requires configuration, meaning that pre-existing system switches are set to adapt the functionality to agency business rules as part of software installation. Typically configuration settings are determined after detailed user interviews and requirements assessments. Features can be described as a

modification ("M") where modification of the base product requires substantial software development effort or creation of additional tables to support the functionality. In any case, ask the vendors to specify whether the changes will carry forward to future releases of the software.

If the functionality will not be achieved until a future software release, require identification of that fact and the release date. If third party software is expected to supply the functionality, for example in a reporting system, then have that separately identified as well.

- *Costs of and Resources Required for Data Conversion.* Data conversion consumes significant implementation resources. Will the price include conversion of existing data? Portions or all of it? Or will the solution only be prospective, requiring the development of a separate data warehouse to get to historical data? Are parallel system operations required, and if so, how long? What is the vendor's approach to developing a data conversion plan? What agency resources will be required, and what will be their skill sets? Assuming the agency has disclosed resource expectations related to implementation – a recommended best practice -- ask the vendor to comment on the adequacy of that commitment. Have the vendor evaluate agency resource commitments (in terms of numbers and skill sets of information technology professionals and functional experts related to the modules). Understand whether they have to be full-time or what percentage of their time would be required to support the implementation.

Phasing

There appears to be general agreement that a phased approach to implementation – as opposed to a "big bang" or "cliff cutover" implementation – is the best idea. This does not mean that companion modules will not be scheduled for production on the same date. Usually, the financial and procurement modules require a common implementation date tied to the fiscal year so the benefits of integration can be achieved: implementing budget and general ledger modules before purchasing modules will lose the benefits achieved from having integrated financial and purchasing transactions.

A common implementation approach in projects is to time the cutover from the old system to the new system to be coincident with how the government manages the change in the fiscal year. In this approach, accounts payable business associated with the prior fiscal year is conducted through the old system until those books are closed and audited (at which time the old system is de-commissioned). Concurrently new business associated with the new fiscal year, such as purchasing and accounts payable, is entered and managed through the new system. The primary reason for this approach is to reduce the workload for data migration. If a mid fiscal year transition is planned, either data for every single transaction needs to be migrated (a huge effort with no ongoing value) or users need to be trained to operate two systems for an extended period of time (which is confusing, laborious, and prone to error).

Phased data conversion is quite common, using a testing or prototype database in phases in advance of the actual production cutover, so the government can achieve testing with various data sets unique to various agencies or departments. The data conversion and testing, along with other testing of the system, precedes the actual "go live" date. Here is a suggested approach:

- Pick a limited number of agencies with representative data issues – e.g., cost allocation requirements driven by federal programs, grants and gifts, inventory operations, etc. – to begin about three to six months into the current fiscal year (before the planned cutover date).

- Do monthly data migrations and testing, involving analysts and accounting personnel in the tests to reconcile numbers in the new system to those in the old system.

- Progressively add more agencies to the monthly migration and testing plan.

- Pick a date two months prior to the "go live" date for the entire enterprise to complete conversion testing of data to be migrated to the new system.

- After testing, execute data loads of complete, current data before the cutover date.

- Develop a plan to shut down the old system on the last day of the fiscal year (or the end of the accounts payable period for the entity's fiscal year) and reconcile open transactions between the old and the new system.

Implementation and Change Control

After contract award and the implementation kickoff, the nature of the activity changes, and the makeup of the teams can change. No matter how well the planning and perfect the solicitation, sometimes the implementation will not unfold exactly as planned and changes may need to be considered.

How Staffing May Change During Implementation

Ideally the planning team involved both high-level sponsorship (for executive support) as well as teams comprised of functional experts. After award, agencies can expect greater involvement of functional experts during the contract administration phase.

It is very important that a realistic implementation timeline is developed to ensure that the appropriate level of trained individuals, equipment and supplies are available for a smooth transition to the new system. To keep project costs down, the agency may consider utilizing more agency personnel than

contractor's staff. This strategy may promote continuity of the project after the contractor's staff has gone. Adequate resources will be needed for the following areas:

- *Implementation team* – staff that is available to establish and manage the implementation schedule. This team will meet often to monitor the implementation process. The team typically has a role in testing and data conversion. At the end of the implementation, the team will have a wrap-up session that will give valuable information to management to inform them how well the overall process went, what worked, what did not work, and why. This information could assist in future system implementation processes.

- *Training* – staff to provide sufficient training to end-users on the operation of the system which should lower the end-users' anxiety and frustration levels while helping them to accept all of the new changes. Also, staff will be needed to create a user-friendly "how to" manual, make any needed changes to the manual quickly, and distribute it to end-users.

- Help desk – staff that will be available to answer questions, report work orders, and provide operational assistance.

Implementation is when agencies encounter most resource demands. These demands are not limited to data integration issues, but much of the interaction between the central project office and users will be related to data issues.

Training becomes progressively more critical. User identification of software and data "bugs" that may have made it through development and testing often coalesces with the more traditional training expectations and leads to greater demands on the training team.

In general, the best practices at this stage include a senior steering committee for making broad strategic decisions, perhaps approving major change proposals. The representation on this committee ideally ties organizationally to the central project office for the implementation and training (with its own representatives in IT, finance, and procurement) and to the agency liaisons for those departments who will be serving as trainers in their own agencies.

Data Conversion Plans

The data conversion plan typically is one of the early actions after contract execution. Appendix B contains selected portions of a sample data conversion plan used on an implementation in Washington County, Oregon.

The vendor's approach to the preparation of the data conversion plan should be an evaluation factor during the solicitation and award phases of the project. The plan educates internal agency personnel

about the operational definition of data elements, their format, and the sources. The plan informs users about the way terms are used under the system, sometimes different from the way that users have learned them. For example, the term "balance sheet" in one system might be known as the "statement of net accounts" in another.

The plan should contain the following elements:

- Identity of the conversion element.

- Source of the data being converted.

- Conversion method, whether manual, automated, or mixed, as well as a description of the automated tools, e.g., Microsoft Excel.

- Responsibility: who is responsible for executing and verifying the various conversions.

- Initial and final conversion dates, when conversion starts and is required to be completed.

- Individual data format descriptions/specifications, e.g., numerical, text, date.

- Individual or "seed" values of the data and/or their source where migrated.

The conversion of data can take several months for complex systems. Normally there are three databases that are involved. There is a testing database that performs the initial technical testing of the conversion. Then there usually is a prototype application/database where experienced users test the conversion in the context of real data. Finally, the production environment/database is the "of record" database that is used for actual transactions.

Without some advance planning, it may be impossible to "fall back" if unexpected developments compromise the successful implementation of the project. At the time the conversion plan is developed, implementation teams should consider planning for going backward to the old system for a temporary period should that become necessary. Maintaining the old system in a "ready condition" as of the cutover date is a first step. Some planning for the steps necessary to restore the old system temporarily to a production environment, and populating the system with minimally necessary information, should be part of the planning process.[9]

System Costs: Expectations and Growth

These projects are complex. Especially without adequate planning, projects may not be completed on schedule, on budget, with the functionality that was expected at the inception. Establishment of a cost contingency is a recommended best practice.[10]

In general, the work group found evidence that:

1. System integration costs increase if the procurement subsystem implementation is delayed until after the financial system. Expect at least a 10% cost "premium" beyond would have been the cost estimate for integrating at the same time as the financial system deployment. Expect at least the same incremental resource cost "premium" on the government's side. Also ETL challenges grow when delaying the procurement module implementation until after the financial system has been in production.

2. Without well-planned implementations, significant project cost growth of 20% was not unusual, in some cases reaching 100%.

3. Cost growth often is managed by sacrificing functionality and integration objectives.

To reflect the practical realities of projects of this complexity, industry recommends establishment of budget contingencies in the range of 15%.

Project Implementation Resources: Expectations and Reality

Governments often underestimate resource requirements. The work group recommends that governments attempt to get as much clarity about estimates and expectations concerning the types of state resources that will be required to support the effort. Most governments have sufficient expertise to estimate the number of personnel and the nature of skill sets they will need to support the project. Vendors like to see the extent of the resource commitment disclosed in the solicitations. Then during the solicitation phase ask the vendor to evaluate the government's estimates within the context of the vendor's proposed solution.

The following list summarizes the data integration/migration activities that occur during contract performance. A clear understanding must be reached about who is expected to perform them:

- Listing required data elements.

- Identifying where they are in the old system and then mapping between fields.

- Performing maintenance on migrated data, e.g., data cleansing.

- Collecting contact information for workflow approvers and other users having accounts and performing activities on the system.

- Writing workflow rules.

- Initially loading the data and system information on users, workflow offices, organizations.

- Testing converted data.

- Reconciling to old system financials.

- In procurement systems with centrally maintained catalogue approvals, spot checking of catalogue information and monitoring consistency with purchasing agreements/contracts.

- Training the trainers.

- Training the users.

As an example that illustrates the magnitude of resources, the work group found a large, decentralized system with an implementation staff of 12 full time and 15 part time agency personnel. A handful of that group was devoted to data conversion and testing activities. Where a vendor will be providing project management and implementation services, the requirements may be less. Smaller ERP implementations, where the business rules generally were adapted to the software solutions, were supported with about 4-5 information technology personnel and one full-time FTE in finance and purchasing, with about one half of the functional expert time devote to data conversion activities. After implementation, the sources reported that internal support requirements remained at about half of original levels to support maintenance and implementation of upgrades.

Achieve as much understanding up-front about agency resource expectations for data conversion, testing, and training in order to avoid underestimating resource requirements.

Change Control and Data Issues

Enterprise-wide system implementations are challenging. After award, the government may have to consider adjustments to functionality, costs, or schedule. It may be a cost consideration if the application is not working due to a modification requested by the government, requiring the contractor to investigate and propose a solution for an additional fee. In all cases, the government will have to determine if a problem and proposed solution will affect the overall functionality of the system -- which may override the cost consideration if the problem will bring the system to a standstill or the solution will not meet the needs of the government. There must be a mechanism for quickly doing the analysis and making the decision so the schedule is not adversely impacted.

There are constraints on the scope of changes. There are instances when the state's regulatory environment – such as federal requirements – cannot be changed. There may be higher education

requirements driven by donations and grants, and other government-specific requirements, that may preclude wholesale business process changes and dictate customization of the software. Unfortunately, changes in the legal and regulatory environment often occur after contract execution and require treatment as a potential change order.

There are other unanticipated changes that often cannot be forecasted. In one implementation, for example, the software system used a series of 5-digit codes for agency identifiers, abbreviated account strings, fund identifiers, and object codes. There was confusion among users about which 5-digit code to use, prompting a change to the field mask to add two more digits to avoid confusion and make training easier. That change required development by the agency of a 54,000-line Microsoft Excel conversion matrix. These are the kinds of changes that the change control process needs to accommodate.

Part of the implementation process should be creation of a process to identify proposed changes and evaluate the root causes for the project performance issues as well as tradeoffs between functionality and cost/schedule when assessing benefits and costs. To ensure accountability and keep the project on track, the government should have an individual or project group that can investigate the situation and make a recommendation about whether changes need to be made to the system and what the impact will have on the system's capability. This process should include an analysis of options, development of recommendations, and include a mechanism for tracking approved changes and their associated costs.

The steering committee often is responsible for evaluating and approving significant changes or tradeoffs between cost and functionality to ensure that a system is delivered that meets the strategic objectives of the agency.

Ideally, this structure would be defined contractually and include contractor participation in the functional analysis and steering committee's cost-benefit analysis required in any proposed change.

Conclusions and Recommendations

The work group agreed that integration of financial and procurement systems offers opportunities for both strategic and operational changes that improve overall efficiencies and reduce costs.

The focus of recent research has examined several areas, such as measuring the value of e-procurement, its impact on purchasing processes, how and why governments adopt e-procurement models, and explanations of e-procurement business cases and phases of e-procurement system development cycle. However the work group found no research that examined the interoperability of procurement and financial solutions. This lack of research has, in part, prompted NECCC to examine in

this paper the issues associated with interoperability of the purchasing and finance functions relative to data migration and data integration.

Migration and integration issues implicate the broader concept of interoperability – effectively linking two or more systems (functionalities) in a transparent way for users. The risk of not moving toward interoperable systems is perpetuation of stovepipe communities without achieving the benefits in efficiency and information utility that come from integration.

This paper addresses an approach to solving the challenges to successfully implementing systems that are interoperable. Many issues must be solved by development of clear expectations during the procurement planning phase, using collaborative planning and sound procurement practices and strategies like those described in this paper. Without cross-collaboration, there is less chance of overcoming the business process challenges and arriving at the goals of integration and interoperability. Early team involvement is key, with an appropriate mix of senior leadership commitment aligned with functional experts knowing data requirements.

The post-award implementation approach is critical to effecting the culture changes necessary to achieve the integration and interoperability that is desired. As the project moves from planning through solicitation into implementation, the team makeup tends to move toward more use of functional experts to support the data conversion. Ideally, this core of functional expert representatives participated when the project was planned and the procurement conducted. Not only does that promote more clarity in expectations at the time of contract execution, the structure is more agile in responding to unanticipated developments and changes that realistically always accompany efforts of this magnitude.

Overall, in migration to new systems, the prevailing practice has been a "going forward" approach: migrating only essential data (e.g, account balances and charts of accounts). Typically the data in the old system is used for historical analysis. Financial data warehousing is an evolving practice used to integrate data between old and new systems to make it available to a broader range of users.

This paper points out best practices in three critical stages – planning, procurement, and implementation – that improve the prospects of completing successful projects that achieve the advantages of integration and interoperability between the financial and procurement systems.

This page is intentionally blank.

Appendix A – Integration/Migration Checklists

This appendix is intended to highlight key data integration/migration issues and provide a checklist from which a cross-functional team can be developed to look at the planning requirements and procurement strategies. The focus here is on issues and potential data elements that are relevant to data integration and migration.

Potential Functions for Integration/Migration

- Budget and Accounting
    - Security and log-in maintenance
    - Accounts Payable
    - Accounts Receivables
    - Administrative Budget
    - Cash Receipts
    - Fixed Assets
    - General Accounting
    - Procurement Card reconciliation
    - Payroll
    - Grants Award, Accounting and Administration
    - Project Accounting and Budgeting
    - Indirect Costs
    - Resource Allocation
    - Revenue Forecasting
    - Cost Allocation
    - Federal Aid Billing
    - Time Entry
    - Activity-based costing modules
    - Collections
- Procurement
    - Requisitions
    - Registered bidders
    - Purchase Orders/Contracts
    - Receiving
    - Invoicing and Payment
    - Inventory
    - Standing Purchase Orders
    - Central Contracts/Price Agreements/Blanket Ordering Agreements
    - On-line catalogs and electronic orders
    - Documented quotes against on-line catalogs
    - Contract Management
    - Procurement card management, analysis, and reporting
    - Strategic Sourcing, Reporting, and Analysis
- Human Resources
    - Applicant Tracking
    - Benefits Management
    - Equal Employment Opportunity
    - Learning Management
    - Leave Tracking
    - Online Applications
    - Performance Evaluation
    - Recruitment, Testing, Evaluation and Selection
- Other
    - Workflow (procurement, finance, and other document approvals)

- o Reports scripts/formats
- o Damage Claims
- o Fleet Management
- o Leases
- o Higher Education Student Receivables/Bursar
- o Student Information Systems
- o Publication Sales
- o Risk Management

Potential Data Elements

- Budget and Accounting
  - o Charts of Accounts
    - Expenditure accounts
    - Expenditure Object Classes and Codes
    - Revenue accounts
    - Fund
    - Organization/Agency identifiers
  - o Vendor Name, billing address, other address, FEIN
  - o Transaction item descriptions
    - Dates
    - Amounts
  - o Revenue versus expenditure flags/fields
  - o Project identifiers
  - o Activity-based costing elements
    - Time
    - Activity descriptors
    - Cost
- Accounts Payable/Vendor Terms
  - o Vendor/Payee Names
  - o Entity Type of Payee, e.g. Corporation, LLC, Sole Proprietor, Trust, Individual, Government, Other
  - o Old Supplier Numbers (for historical file management purposes)
  - o Vendor/Payee Tax Identification Numbers
  - o Tax Reporting Names (if different)
  - o 1099 Reporting Flags
  - o Addresses
  - o Payee phone numbers
  - o Flags for Purchasing/Deliverables vs Payables on Addresses
  - o Minimum order amounts
  - o General discount terms
  - o Bank Accounts/Payment Methods/EDI fields
  - o Multiple Vendor Bill to/Ship To Locations
  - o Small Business/Disadvantaged Business Status
  - o Industry Classification Codes
  - o Payment currency flags
  - o Offset/hold payment flags
  - o Pay on codes, e.g. on receipt or packing slip

- Procurement Modules
  - o Date of requisition
  - o Transaction Types: Purchase Orders, Contract Agreements, Blanket Purchase Agreements
  - o Item description
  - o Requisitioner

- o Quantity
- o Units of Measure
- o Delivery date/performance period(s)
- o Price
- o Order specific discount terms
- o Credit terms
- o Freight/Transportation terms, e.g. FOB
- o Freight Charges
- o Tax charges/tax calculation flags
- o Shipment location/drop shipment locations with fields for each of the above (item, quantity, price, transportation charge, delivery date/performance period)
- o Commodity code
- o Procurement card
    - • Reconciliation fields
    - • Cardholder information
    - • Card numbers
    - • Expiration dates and security codes
- o Inventory
    - • SKU or item descriptors
    - • Quantity
    - • Min/max order quantities
    - • Item location codes
    - • Customer/internal order flags
    - • Returnable flags
    - • Purchasing market price
    - • Fixed asset categories
    - • Rounding factors
    - • Units of issue and measure
    - • Delivery terms/flags
    - • Receiving tolerances
    - • Shelf life codes
    - • Measurement tolerances
    - • Safety stock amounts/days
    - • Counting cycle codes
    - • Item expense/encumbrance accounts
- o Invoice fields
- o Credit memos for partial shipments or reduced delivery acceptance
- o Receiving reports/packing slip receipt
- o Receiving/delivery tolerances
- • Workflow
    - o Contact information: names, phones, and emails
    - o Business Rules
    - o Delegation permissions
- • Reports scripts and formats (all modules)

Information of Value to Vendors During Solicitations

- • Description of the business process the data is related to
- • Description of systems required to be integrated
- • Agency staff (number of personnel and skill sets) that will be made available for implementation
- • Whether there will be a requirement for Independent Verification & Validation of data conversions, and who the vendor is (if already selected)
- • Required paper output/written documentation in reports generation or any interfaces

- Graphic depictions of forms the data relates to, e.g. purchase orders generated by the system or payment voucher transactions
- Numbers of transactions in old system that will require conversion, along with data elements on those transactions
- Numbers of documents that these transactions relate to, e.g. numbers of purchase orders and contracts
- Data Warehouse platform
- Reporting tools currently used by the agency
- "Record layouts" or access to on-line descriptions of data and schema
- Known expectations concerning vendor "scrub" of existing data before migration or integration development
- Known constraints, such as nonstandard field formats or absence of edit checks to promote data format standardization
- Number of simultaneous users
- Known flexibility on the use of batch versus real time integration of disparate systems, the willingness to accept system performance tradeoffs for real time integration solutions, the willingness to consider cost tradeoffs for batch integration solutions, and any other preferences that will be extended to vendors during evaluation for either solution
- Documentation delivery requirements of data schema
- Desktop applications that are required to provide data interface with the system, e.g. Microsoft Excel, generalized ASCII fixed field and delimited formats, etc.

Information to Request from Vendors

- In general, what tools are available for converting from the existing system? For converting existing reports? Are these tools integrated and bundled with the package?
- Integration
    - o For the systems that have been described as needing interfaces, which has the vendor developed interfaces for?
    - o What common file formats exist in the product as bundled to facilitate interfaces with other systems?
    - o What practical limitations exist in the solution with respect to integration with legacy systems?
    - o What real-time integrations between financial system and procurement [other] systems has the vendor performed?
    - o How would the vendor recommend making the choice between batch and real-time integration? What is necessary to integrate the workflow engine to other vendors' products?
- Approach to developing a data migration plan
- Approach to testing data conversion
- Whether software has data capability (e.g. edit checking, "speed" data lookup capability) that currently exists, requires customization, or is scheduled for a future release
    - o What is the vendor's definition of customization and the timing for new releases?
    - o What cost is associated with either?
    - o What can the agency practically expect to support with its own resources?
    - o What schedule impact associated with either?
- Products that the vendor has performed an integration with
- Role of the agency in data conversion mapping, loading, and testing
- Comment on the realism of agency disclosures of numbers and skill sets of agency personnel that will be made available for the implementation
- What efficiency features are available to reduce data entry workload?
- Role of the agency in data conversion testing
- When manual conversion might be necessary, and the role of the agency in manual conversion

- How are system edits applied? At transaction entry? During integrated transactions involving disparate systems?
- How are business rules supporting workflow maintained? Can workflow maintenance be decentralized through delegation that lets subordinate agency delegates establish workflow within defined parameters?
- Does the workflow engine have contingent routing for backup individuals/roles?
- Is data maintained showing where workflow was passed and when the approvals/actions were entered?
- What procurement card integrations has the vendor completed? Which procurement card systems? Was there any integration of commodity code detail in Level 3 reporting or only object code detail?
- What commodity code structures does the vendor have experience with? From the vendor's perspective, what are the pros and cons of NIGP, UNSPSC, and others?
- What end-user query and reporting tools are bundled with the product? What common standards do they meet?
- Does the system permit "query by example" for returning quick data sets?
- Is it necessary to leave the application to launch the analysis/reporting function?
- Does the application support importing existing supports from the old system?
- What documentation is provided to assist user in locating correct tables and columns to build queries? What role does the agency play in creating those user aids?
- What other data mining or other business intelligence tools come bundled with the product? Based on the vendor's knowledge of the agency mission, how would those tools likely be used to improve performance?
- Do batch facilities provide a scheduling mechanism for scheduling jobs to be run?
- If batch processing is used, are they sequenced and how is error checking handled in the case of errors?
- How do batch-processing facilities notify staff of success or failure?
- In general, to what degree are the financial and procurement integrated to provide a common look and feel, common business rules, security, validation and lookup tables, easy posting/updating of information from one application to anther, and drilldown to source information and support documentation between modules?
- Consider requiring separate cost breakdowns for:
  - Converting and integrating the data
  - Verifying the accuracy of the converted data
  - Testing the converted data

This page is intentionally blank.

Appendix B – Washington County, Oregon Conversion Plan (Selected)

Introduction

This document presents the Conversion Plan for the Washington County Information System And Resource Database (WISARD). The County will be implementing the Oracle Public Sector General Ledger, Public Sector Budgeting, Public Sector Purchasing, Public Sector Payables, Assets, Receivables, Projects, and Inventory modules. This WISARD Conversion Plan provides a description of the conversion activities that need to be accomplished to "load and prepare" the WISARD production database for all of the WISARD applications.

WISARD will require the following types of information to be converted and/or loaded for the July 2001 implementation:

Reference Data – which includes the initial loading of the COA and other static data into WISARD. The following reference data will need to be loaded:

COA values, attributes, and roll-up relationships

Suppliers (including County employees)

Items/Commodities

Supplier Lists

Miscellaneous purchasing codes

Employees/Positions for Approvals

Customers

Bank Information

Asset Information

Project Information

Budgets – which include adopted Fiscal Year 2002 budgets. The prior two years of historical adopted budgets will also be loaded for reporting purposes.

Balances – which includes the Fund level balance sheet account balances from Fiscal Year 2001. The prior two years of historical balance sheet account balances, expense balances and revenue balances will also be loaded for reporting purposes.

Open Items – which includes purchase orders and invoices open at the end of Fiscal Year 2001that need to be transferred over to WISARD.

The WISARD Conversion Plan describes the scope, strategy, automated conversion program specifications, and schedule for the required conversions for WISARD. The remainder of this document is organized into the following sections:

Section 2, Conversion Approach and Strategy, discusses the general approach to be followed for WISARD conversion.

Section 3, Conversion Program Specifications, identifies and provides process specifications for each automated conversion that will be needed.

2. Conversion Approach and Strategy

Some of the data to be loaded will be derived from existing systems such as FMIS. Other information will be new to County (e.g., new chart of accounts elements) and has been defined during the analysis stages of the project. There will be two methods used for loading WISARD tables:

Manual Conversion – where data will be manually loaded by using the standard WISARD forms and screens for entry. Manual conversion will be used in the following situations:

> Volume of data to be converted is low
>
> Data is not available in an electronic form
>
> The complexity of developing an automated conversion program is such that automated conversion is not practical

Automated Conversion - where data is loaded using a specialized program that processes, formats and loads existing data available in an electronic form.

In some cases a "mixed" conversion will be necessary where data is first loaded using a conversion program and additional manual entry of data is required to complete the conversion. For example, the loading of the WISARD Assets is a case where a mixed conversion method may be followed.

Typically, a conversion process for a system like WISARD can take several months especially if the level of manual conversion is high. Conversion cannot merely be accomplished just prior to going live since sufficient time to enter manual conversions and reconcile converted data is required. As a result, the WISARD conversion strategy to be adopted will support a conversion process that converts some critical data early in the project lifecycle.

The conversion will incorporate the following key components and steps:

❖ A Test Database (and related WISARD modules) will be "set-up" and tailored based on the decisions made and documented during the Implementation Analysis Consultant processes.

❖ Once the set-up has been completed, a Database Import/Export will create additional WISARD databases: a Prototype Database used for supporting the WISARD testing and training efforts; and a Production Database that will ultimately become the final production system for WISARD.

❖ The Production database will be populated with data resulting from automated conversions (for COA, vendors, items, etc.) as well as data to be converted through manual data entry.

In the case of all automated conversions, an initial run of the conversion is first made into the Test Database where converted data is verified and reconciled. After a successful conversion run in Test, a second conversion run is made into the Prototype Database where the conversion is verified by the County before being run against the Production Database.

Exhibit 1 presents a summary of the conversions that will be needed for WISARD. For each conversion process, the following has been identified:

- ❖ **Application Area** - which identifies the WISARD functional module impacted by the conversion.

- ❖ **Conversion Name** - identifies the specific conversion and/or the WISARD table(s) to be populated.

- ❖ **Source** - identifies the source and/or location of the conversion data.

- ❖ **Conversion Method** - Either manual, automated or mixed (automated and manual)

- ❖ **Responsibility** - identifies who will be responsible for executing and verifying the conversion.

- ❖ **Initial Conversion Date** - identifies the date when an initial conversion (if any) is accomplished. An initial conversion may be required

- ❖ **Final Conversion Date** - identifies the final completion date for the conversion process.

EXHIBIT 1
SUMMARY OF WISARD CONVERSIONS

Conversion Name	Source	Conversion Method	Responsibility	Initial Conversion Date	Final Conversion Date
General Ledger					
COA Values and Relationships	Spreadsheets	Manual preparation of spreadsheets. Automated load of values and immediate parent-child relationships. **Note:** All maintenance after initial load is done in WISARD	Cheif Accountant (GL Module Lead) prepares data. Implementation Consultant loads COA and parent-child relationships. Cheif Accountant (GL Module Lead) manually assigns additional parent-child relationships.	4/1/01	5/31/01
Budgets for FY 2002	Budget Spreadsheets	Application Desktop Integrator (ADI) Journal Wizard	Cheif Accountant (GL Module Lead)	6/1/01	6/23/01
Prior two years of Adopted Budgets	Budget Spreadsheets	Application Desktop Integrator (ADI) Journal Wizard	Cheif Accountant (GL Module Lead)	N/A	N/A
Balance Sheet Account Balances June 2001 forward	Spreadsheets	Application Desktop Integrator (ADI) Journal Wizard	Cheif Accountant (GL Module Lead)	N/A	Close of Fiscal Year '01
Prior two years of Balance Sheet Accounts, Expense and Revenue balances	Spreadsheets	Application Desktop Integrator (ADI) Journal Wizard	Cheif Accountant (GL Module Lead)	N/A	N/A
Cross Field Validation Rules	Paper	Manual – Dependant on COA Conversion	Implementation Consultant trains on entry. Cheif Accountant (GL Module Lead) enters rules.	N/A	5/31/01
Segment Value Security Rules	Paper	Manual – Dependant on COA and Responsibility Conversion	Implementation Consultant trains on entry. Cheif Accountant (GL Module Lead) enters rules.	N/A	6/9/01
Accounts Payable					

EXHIBIT 1 SUMMARY OF WISARD CONVERSIONS					
Conversion Name	Source	Conversion Method	Responsibility	Initial Conversion Date	Final Conversion Date
Open Invoices from Fiscal Year '01	FMIS	Manual: Note that A/P invoices to be paid out of 2001 funds will be handled in FMIS. Only invoices that are open and to be paid from 2002 funds will be manually entered in WISARD.	Financial Operations Supervisor (Payables Module Lead) identifies and enters	N/A	6/30/01
Bank Accounts	Paper	Manual	Implementation Consultant as part of the initial setup	N/A	N/A
Supplier Payment Terms	Paper	Manual	Financial Operations Supervisor (Payables Module Lead)	N/A	N/A
Supplier Pay Sites	FMIS	Automated: Supplier Interface from Spreadsheets followed by manual update where necessary. See Purchasing vendor file conversion.	Buyer (Purchasing Module Lead), Financial Operations Supervisor (Payables Module Lead)	5/1/01	5/31/01
Purchasing Card Holder Information	Paper	Manaul	Financial Operations Supervisor (Payables Module Lead)	5/1/01	5/31/01
Purchasing					
Locations	Paper	Manual	Buyer (Purchasing Module Lead)	N/A	6/9/01
Employee Positions	Spreadsheets	Manual	HR Module Lead	5/8/01	6/9/01
Employees	Spreadsheets	Manual	HR Module Lead	5/8/01	N/A
Approval Hierarchy	Paper	Manual: Purchasing collects data and manually enters approval hierarchy.	Buyer (Purchasing Module Lead)	N/A	5/12/01
Approval Rules	Paper	Manual	Buyer (Purchasing Module Lead)	N/A	5/12/01
Buyers	Paper	Manual	Buyer (Purchasing Module Lead)	N/A	5/12/01
Units of Measure	Paper	Manual	Buyer (Purchasing Module Lead)	N/A	5/12/01
Suppliers/Supplier Sites	Spreadsheets from FMIS & Horizons	Automated: Supplier Interface from Spreadsheets followed by manual update where necessary.	Database Administrator, Buyer (Purchasing Module Lead)	5/1/01	5/31/01
Employee Supplier	FMIS	Included in Suppliers/ Supplier Sites Conversion	N/A	N/A	N/A
Supplier Lists	FMIS	Manual	Buyer (Purchasing Module Lead)	N/A	5/31/01

Best Practices in Integration of Procurement and Financial Management Data

		EXHIBIT 1			
		SUMMARY OF WISARD CONVERSIONS			
Conversion Name	**Source**	**Conversion Method**	**Responsibility**	**Initial Conversion Date**	**Final Conversion Date**
Items	NIGP	Automated Financial Operations Supervisor (Payables Module Lead) will assign default account code and Fixed Asset Category to each item where appropriate.	Database Administrator, Buyer (Purchasing Module Lead)	5/1/01	5/31/01
Open Requisitions	FMIS	Manual County will identify all open RXs to be carried forward.	Buyer (Purchasing Module Lead)	N/A	6/21/01
Open Purchase Orders and Releases	FMIS	Manual County will identify all open POs to be carried-forward Note that the PO balance will also need to be carried-forward as an additional budget amounts for FY 2002 for existing obligations.	Buyer (Purchasing Module Lead)	N/A	6/21/01
RFQs	FMIS	Manual County will identify all open RFQs to be carried forward.	Buyer (Purchasing Module Lead)	N/A	6/21/01
Quotations	FMIS	Manual County will identify all open quotes to be carried forward.	Buyer (Purchasing Module Lead)	N/A	6/21/01
Contract Agreements	Paper	Manual County will identify all open contracts to be carried forward.	Buyer (Purchasing Module Lead)	N/A	6/21/01
Blanket Purchase Agreements	FMIS	Manual County will identify all open Price Agreements to be carried forward.	Buyer (Purchasing Module Lead)	N/A	6/21/01
Inventory					
Inventory Items	Peachtree Inventory System	Manual	Buyer (Purchasing Module Lead)	5/1/01	5/31/01
Assets					
Asset Categories	Spreadsheet	Manual	Chief Accountant (GL Module Lead)	6/1/01	6/16/01
Locations	Spreadsheet	Manual	Chief Accountant (GL Module Lead)	6/1/01	6/16/01

EXHIBIT 1 SUMMARY OF WISARD CONVERSIONS					
Conversion Name	**Source**	**Conversion Method**	**Responsibility**	**Initial Conversion Date**	**Final Conversion Date**
Asset Keys	Spreadsheet	Manual	Chief Accountant (GL Module Lead)	6/1/01	6/16/01
Assets	Spreadsheets	Manual: ADI Assets will be converted only after activity for FY 2001 is completed in the existing system.	Chief Accountant (GL Module Lead)	6/19/01	6/30/01
Receivables					
Customers	FMIS	Manual – Expecting a little over 500 customers to be converted.	Receiving Module Lead	5/1/01	5/31/01
Customer Banks	Paper	Manual	Receiving Module Lead	5/1/01	5/31/01
Transaction Types	Spreadsheet	Manual	Receiving Module Lead	5/1/01	5/31/01
Standard Memo Lines	Spreadsheet	Manual	Receiving Module Lead	5/1/01	5/31/01
Open Invoices for FY 2001	FMIS	Manual **Note:** Open invoices will include all open invoices, disputed invoices, and invoices with partially applied receipts. Need to retain original invoice date to allow aging reporting. Invoices for which cash has been received will receive priority; the remaining will be completed within two weeks.	Receiving Module Lead	7/1/01	7/15/01
Deposits	FMIS	Manual	Receiving Module Lead	7/1/01	7/15/01
Projects					
Service Types	Paper	Manual	Capital Projects Management Analyst (Projects Module Lead)	5/1/01	5/31/01
Organizations	Paper	Manual	Performed as part of the initial setup	N/A	N/A
Class Categories	Paper	Manual	Capital Projects Management Analyst (Projects Module Lead)	5/1/01	5/31/01
Class Codes	Paper	Manual	Capital Projects Management Analyst (Projects Module Lead)	5/1/01	5/31/01

EXHIBIT 1 SUMMARY OF WISARD CONVERSIONS					
Conversion Name	**Source**	**Conversion Method**	**Responsibility**	**Initial Conversion Date**	**Final Conversion Date**
Project Types	Paper	Manual	Capital Projects Management Analyst (Projects Module Lead)	5/1/01	5/31/01
Projects/Tasks	Spreadsheet	Manual **Note:** Need related invoice references for inquiries.	Capital Projects Management Analyst (Projects Module Lead)	6/1/01	6/30/01
Security					
UNIX Printer Definitions	Paper Forms	Manual	Database Administrator	N/A	6/23/01
User Menus	Paper Forms	Manual	System Administrator	N/A	6/23/01
Report Programs	Paper Forms	Manual	System Administrator	N/A	6/23/01
Function Security Rules	Paper Forms	Manual	System Administrator	N/A	6/23/01
Responsibilities	Paper Forms	Manual	System Administrator	N/A	6/23/01
User IDs and Passwords	Paper Forms	Manual	System Administrator	N/A	6/23/01
Printers Definitions	Paper Forms	Manual	System Administrator	N/A	6/23/01
User Printer Defaults	Paper Forms	Manual	System Administrator	N/A	6/23/01
User Defaults (printer max pages, word processor, folder rules, attachment rules)	Paper Forms	Manual	System Administrator	N/A	6/23/01

3. Conversion Program Specifications

In this section, we have presented specifications for all identified automated conversion programs that need to be developed to support the WISARD conversion efforts. The following conversion programs have been specified:

- ❖ COA Values and Relationships

- ❖ Suppliers/Supplier Sites

- ❖ Items

For each of the above conversion programs, we have provided a brief description of the processing and a conversion map identifying the specific WISARD table(s) and fields that need to be populated.

3.1. COA Values and Relationships

<u>System Description</u>

The loading of the County Chart of Account values and related descriptions will be accomplished by an automated conversion program. The County is currently in the process of developing the COA on Excel spreadsheets that identify:

- ❖ COA value

- ❖ Description

- ❖ Parent (Yes or No)

- ❖ Roll-Up Group

- ❖ Immediate Parent Value

- ❖ Various Segment Attributes

The automated conversion program will use values from a manually entered "seed" record combined with data from these spreadsheets to create records in FND_FLEX_VALUES. These spreadsheets will be used as the input file to load the COA in WISARD using the following steps:

Create a separate ACSII file for each COA spreadsheet

Fund

Program

Account

Manually enter seed records for each of the segments.

EXHIBIT 2			
FND-FLEX-VALUES FOR COA LOADING			
Field Name	**Description**	**Req./Opt. Format**	**Value**
FLEX_VALUE_ SET_ID	Flexfield value set identifier	Required NUMBER (10)	Set the appropriate value depending on the segment being loaded. Use the appropriate FLEX_VALUE_SET_NAME shown below to get the ID from FND_FLEX_VALUE_SETS table: WISARD_Fund WISARD_Program WISARD_Account
[PARTIAL TABLE]			

EXHIBIT 3			
FND_FLEX_VALUE_HIERARCHIES FOR COA LOADING			
Field Name	**Description**	**Req./Opt. Format**	**Value**
FLEX_VALUE_ SET_ID	Flexfield value set identifier	Required NUMBER (10)	Set the appropriate value depending on the segment being loaded. Use the appropriate FLEX_VALUE_SET_NAME shown below to get the ID from FND_FLEX_VALUE_SETS table: WISARD_Fund WISARD_Program WISARD_Account
[PARTIAL TABLE]			

3.2 Suppliers/Supplier Sites

<u>System Description</u>

The loading of the County Suppliers and Supplier Sites will be accomplished by an automated conversion program. The County is currently in the process of developing an Excel spreadsheets that identifies for each Supplier and Supplier Site:

❖ Old Supplier Number

❖ Supplier Name

❖ Site Name

❖ Supplier Type (Employee vs. Supplier)

❖ Federal ID Number

❖ Tax Reporting Name

❖ Address Line 1

❖ Address Line 2

❖ Address Line 3

❖ City

❖ State

❖ Zip

❖ Purchasing Site Flag

❖ Payables Site Flag

❖ RFQ Only Site Flag

❖ Phone Number

The automated conversion program will use values from manually entered "seed" records combined with data from this spreadsheet to create records in PO_Vendors and PO_Vendor_Sites_All. This spreadsheet will be used as the input file to load suppliers in WISARD using the following steps:

Create an ASCII file from spreadsheet

Manually enter seed records for one supplier and associated supplier site.

Load PO_Vendors table for each unique Federal ID Number as shown in Exhibit 4 using the ASCII file and seed record.

Load PO_Vendor_Sites_All table for each Federal ID Number and Site as shown in Exhibit 5 using the ASCII file and seed record.

Exhibit 4			
PO_Vendors			
Field Name	**Description**	**Req./Opt. Format**	**Source**
VENDOR_ID	Vendor Unique Identifier	NUMBER	Select max(vendor_id)+1 from po_vendors;
LAST_UPDATED_BY	Standard Who column – lists the user name who last updated the record.	Required NUMBER	7
VENDOR_NAME	Vendor name	Required VARCHAR2(80)	Supplier Name from ASCII file
REMAINDER OF VENDOR TABLE CONSISTED OF OVER 120 FIELDS			

Exhibit 5			
PO_Vendor_Sites_All			
Field Name	**Description**	**Req./Opt. Format**	**Source**
ADDRESS_STYLE	No description listed	VARCHAR2(30)	Seed Record
LANGUAGE	Site language	VARCHAR2(30)	Seed Record
PROVINCE	Province	VARCHAR2(25)	Seed Record
COUNTRY	Country name	VARCHAR2(25)	Seed Record
PHONE	Phone number	VARCHAR2(15)	Phone Number from ASCII file
CUSTOMER_NUM	Customer number with the vendor site	VARCHAR2(25)	Seed Record
SHIP_TO_ LOCATION_ID	Default ship-to location unique identifier	NUMBER	Seed Record
REMAINDER OF VENDOR SITES TABLE CONSISTED OF OVER 95 FIELDS			

3.3. Items

The Item Interface import items into Oracle Inventory and Oracle Public Sector Purchasing. When items are imported through the Item Interface, new items are created in the item master organization or existing items are assigned to additional organizations. Values can be specified for all item attributes, or just a few attributes allowing the remainder to default or remain null. Validation of imported items is done using the same rules as the item definition windows.

Before using the Item Interface, a custom program must be written and run to extract item information from an ASCII file and insert it into the MTL_SYSTEM_ITEM_INTERFACE table as specified in Exhibit 6. The County is currently in the process of developing an Excel spreadsheets that identifies for each purchasing item:

❖ NIGP Class

❖ NIGP Item

❖ NIGP Description

❖ Default Account

After the items are loaded into the interface table, the Item Interface is run to import the data. The Item Interface assigns defaults, validates data included, and then imports the new items.

Exhibit 6 MTL_SYSTEM_ITEMS_INTERFACE			
Field Name	**Description**	**Req/Opt Format**	**Source**
INVENTORY_ ITEM_ID	Inventory item identifier	NUMBER	Null
ORGANIZATION_ID	Organization Identifier	NUMBER	select organization_id from hr_all_organization_units where name = 'Item Master Organization'
END_DATE_ACTIVE	Flexfield segment end date	DATE	Null
DESCRIPTION	Item description	VARCHAR2(240)	NIGP Description from ASCII file
BUYER_ID	Buyer identifier	NUMBER	Null
INVOICING_RULE_ID	Invoicing rule identifier	NUMBER	Null
INVENTORY CONVERSION TABLE CONSISTED OF OVER 25O FIELDS			

Acknowledgements

References

[1] For a discussion of the strategic issues and role of information in electronic procurement, see the NECCC Workgroup Paper, *E-Procurement: Failure to Implement, Not an Option* (2002), http://www.ec3.org.

[2] Glossary at http://www.dmreview.com/resources/glossary.cfm?keywordId=D

[3] Larry Goldman, "Driving Toward Action: The Action Stage," *DMReview* (May 2005)

[4] Scott, Judy. "What are the primary issues involved with integrating front-end and back-end systems?" in Laube and Zammuto, Ed., *Business Driven Information Technology: Answers to 100 Critical Questions for Every Manager*. Stanford: Stanford University Press, 2003.

[5] Komoto, Shirley, "What does technology implementation failure look like?" and Scott, Judy, "What risks does an organization face from an ERP Implementation?" in Laube and Zammuto, Ed., *Business Driven Information Technology: Answers to 100 Critical Questions for Every Manager*. Stanford: Stanford University Press, 2003.

[6] Dodge, Gary. "What are data warehouses and what are their uses?" in Laube and Zammuto, Ed., *Business Driven Information Technology: Answers to 100 Critical Questions for Every Manager*. Stanford: Stanford University Press, 2003.

[7] White, William. "What is Middleware and What Are the Business Implications of Its Use?" in Laube and Zammuto, Ed., *Business Driven Information Technology: Answers to 100 Critical Questions for Every Manager*. Stanford: Stanford University Press, 2003.

[8] Is the Lack of E-procurement Standards A Barrier to Implementation? A Government and Supplier Perspective. National Electronic Commerce Coordinating Council. December 2001, http//www.ec3.org/Downloads/2001/e-Procurement_Standards_ED.pdf.

[9] Laube, David. "Should you plan for Failure?" In Laube and Zammuto, Ed., *Business Driven Information Technology: Answers to 100 Critical Questions for Every Manager*. Stanford: Stanford University Press, 2003.

[10] *Ibid.*